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Bypassing Russia: Nabucco project and its implications for the European gas security

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ABSTRACT

Restrictions on CO_2 emissions, the nuclear phase-out announced by some member states, high emissions from coal-fired power plants, and barriers to rapid development of renewable generation are factors that make the European Union (EU) highly dependent on natural gas. With three non-EU countries (Russia, Algeria and Norway) currently supplying more than half the gas consumed within the EU and with projections pointing out that by 2030 internal sources will only be able to meet 25% of demand, the EU desperately looks for means to secure new sources of gas supply. In this context, the Nabucco pipeline is planned to deliver gas from Caspian and Middle East regions to the EU market. It runs across Turkey and then through Bulgaria, Romania and Hungary before connecting with a major gas hub in Austria. On paper, Nabucco project makes perfect sense, offering a new export route to the EU markets for Caspian gas producers (Azerbaijan, Turkmenistan and Kazakhstan) as well as Iran and, in time, Iraq. The project is backed by the EU and strongly supported by the United States. Perhaps most importantly, Nabucco would completely bypass Russia. This paper addresses issues surrounding Nabucco project and their implications for the European gas security.

Contents

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1. Introduction

One evening in 2002 in Vienna, a small group of Austrian energy executives took their colleagues from Turkish, Hungarian, Bulgarian, and Romanian gas companies to see an opera. The officials had spent the day sketching out a plan for a 3300 km pipeline that could transport up to 31 bcm of natural gas every year into the EU markets. The opera they attended that night was called Nabucco and that is the name they gave to their pipeline [1].

The security of natural gas supply is one of the main issues of the EU energy strategy to be followed in the future. Natural gas, as a cleaner burning source of fossil fuel than oil or coal, is now commonly believed to offer part of the solution to climate change and to problems associated with poor air quality. As a plentiful, economically viable and less polluting fuel, natural gas also makes sense for the EU as a source for power generation. Therefore, consumption of natural gas in the EU is steadily increasing and it is likely to become the most significant energy source throughout the next two decades by moving from 533 bcm in 2008 to 753 bcm in 2030 [2]. The increase in consumption by households and industry will not be covered by the EU production nor will Russia be able to feed the rising demand without re-exports from Caspian and Central Asia after 2015. This is partially due to Russia's declining production in Yamal peninsula of West Siberia and largely due to relative advantages of commercializing Eastern gas at Chinese and Japanese markets. The sharp rise in Russia's domestic demand is another pressure. Besides, Russia's problems with Ukraine, which created interruptions of gas flow to Europe in January 2006 and January 2009, doubled the EU energy security concerns to diversify suppliers.

The present paper provides a framework for understanding the importance of Nabucco project for the European gas security. Despite its significance, so far, the project and its repercussions for the EU gas security have not been studied from an academic point of view and therefore current paper is expected to contribute current literature of energy studies in this respect. The analysis, in the following section, is focused on evaluation of the EU gas demand and supply balance to facilitate the understanding of the context in which Nabucco is designed. Section 3 provides a brief summary of the project and historical background. This section also focuses on main strengths and drawbacks of the project. It also mentions its chief rival, namely South Stream pipeline project. Next section is devoted to policies of different actors on Nabucco project, including the EU, Russian, Turkish, Azeri, Turkmen, Iranian and Hungarian policies. Section 5 not only critically analyses these policies but also provides some policy suggestions. Final section concludes.

2. European natural gas demand and supply balance

On a global level, natural gas resources are unequally distributed. Tables 1–3 show top 20 countries with the largest proved gas reserves, production and consumption, respectively, in 2008 [3].

As can be seen in Table 1, the largest gas reserves are located in the Russian Federation (43.3 tcm), followed by Iran and Qatar with 29.6 and 25.5 tcm, respectively. These three countries alone account for 53.2% of global proven gas reserves of 185 tcm. In production, Russia again has the largest share with 602 bcm gas production in 2008, closely followed by US with 582 bcm. The top five gas producers account for 51.6% of world production. On consumption side, again US and Russia have the leading figures and are responsible for 35.9% of total gas consumption. However, it is important to note that although US and Russia dominate both production and consumption, international gas market is dominated by Russia only as US consumes more gas than it produces while Russia exports about 30% of its gas.

Table 1
Proved natural gas reserves (trillion cubic meters).

	Countries	1988	1998	2008	Share of total
1.	Russian Federation	n/a	43.51	43.30	23.4%
2.	Iran	14.20	24.10	29.61	16.0%
3.	Qatar	4.62	10.90	25.46	13.8%
4.	Turkmenistan	n/a	2.51	7.94	4.3%
5.	Saudi Arabia	5.02	6.07	7.57	4.1%
6.	US	4.76	4.65	6.73	3.6%
7.	United Arab Emirates	5.66	6.00	6.43	3.5%
8.	Nigeria	2.48	3.51	5.22	2.8%
9.	Venezuela	2.86	4.15	4.84	2.6%
10.	Algeria	3.23	4.08	4.50	2.4%
11.	Indonesia	2.56	2.18	3.18	1.7%
12.	Iraq	2.69	3.19	3.17	1.7%
13.	Norway	2.30	3.79	2.91	1.6%
14.	Australia	1.11	1.65	2.51	1.4%
15.	China	0.92	1.37	2.46	1.3%
16.	Malaysia	1.49	2.41	2.39	1.3%
17.	Egypt	0.33	1.02	2.17	1.2%
18.	Kazakhstan	n/a	1.81	1.82	1.0%
19.	Kuwait	1.38	1.48	1.78	1.0%
20.	Canada	2.67	1.75	1.63	0.9%
	Total World	109.72	148.01	185.02	100.0%
	of which: the European Union	*3.65*	*3.77*	*2.87*	*1.6%*

Italics in the tables show the share of EU in total figures.

Table 2
Natural gas production in 2008 (billion cubic meters).

	Countries	Production	Share of total
1.	Russian Federation	601.7	19.6%
2.	US	582.2	19.3%
3.	Canada	175.2	5.7%
4.	Iran	116.3	3.8%
5.	Norway	99.2	3.2%
6.	Algeria	86.5	2.8%
7.	Saudi Arabia	78.1	2.5%
8.	Qatar	76.6	2.5%
9.	China	76.1	2.5%
10.	Indonesia	69.7	2.3%
11.	United Kingdom	69.6	2.3%
12.	Netherlands	67.5	2.2%
13.	Turkmenistan	66.1	2.1%
14.	Malaysia	62.5	2.0%
15.	Uzbekistan	62.2	2.0%
16.	Egypt	58.9	1.9%
17.	Mexico	54.9	1.8%
18.	United Arab Emirates	50.2	1.6%
19.	Argentina	44.1	1.4%
20.	Trinidad and Tobago	39.3	1.3%
	Total World	3065.6	100.0%
	of which: the European Union	*190.3*	*6.2%*

Italics in the tables show the share of EU in total figures.

EU27 has only 2.87% of proved world gas reserves and is responsible for 6.2% of world production while it consumes about 16.2% of the gas produced in the world. Historically, gas consumption of EU27 has been rising from 39.3 bcm in 1965 to 490.1 bcm in 2008, corresponding to an annual growth rate of 6.33%. Indigenous production covered 39% of the demand in 2008, mainly from the UK (69.6 bcm) and the Netherlands (67.5 bcm). In 2008, with gas exports of 115 bcm to the EU, Russia was by far the largest gas supplier for the EU. Second major supplier was Norway with exports of 85 bcm, followed by Algeria with 49 bcm. In 2008, these three countries provided 51% of total gas consumed in the EU and dependence of the EU on imported gas was 64% in total. So, it is obvious that the EU is highly dependent on gas imports and especially those from Russia (23% of total demand), Norway (17% of total demand) and Algeria (10% of total demand). Table 4 shows the EU gas trade in 2008 [4].

Table 3
Natural gas consumption in 2008 (billion cubic meters).

	Countries	Consumption	Share of total
1.	US	657.2	22.0%
2.	Russian Federation	420.2	13.9%
3.	Iran	117.6	3.9%
4.	Canada	100.0	3.3%
5.	United Kingdom	93.9	3.1%
6.	Japan	93.7	3.1%
7.	Germany	82.0	2.7%
8.	China	80.7	2.7%
9.	Saudi Arabia	78.1	2.6%
10.	Italy	77.7	2.6%
11.	Mexico	67.2	2.2%
12.	Ukraine	59.7	2.0%
13.	United Arab Emirates	58.1	1.9%
14.	Uzbekistan	48.7	1.6%
15.	Argentina	44.5	1.5%
16.	France	44.2	1.5%
17.	India	41.4	1.4%
18.	Egypt	40.9	1.3%
19.	South Korea	39.7	1.3%
20.	Spain	39.0	1.3%
	Total World	3018.7	100.0%
	of which: the European Union	*490.1*	*16.2%*

Italics in the tables show the share of EU in total figures.

UK, Germany, Italy, Netherlands, France and Spain are the major natural gas markets with considerably high amounts of consumption above 35 bcm per year, as shown in Table 5. Belgium, Poland, Romania and Hungary are medium size markets with a consumption of between 12 and 18 bcm. The annual consumption of other EU members is less than 10 bcm for each but they might constitute coherent regional markets comprised of two or more relevant countries. The import dependency for natural gas was 60% in 2008 for the EU as a whole. The dependency on imports from abroad, however, differs significantly between countries. 22 member countries of the EU27 import more than 80% of their gas consumption and 11 of them are totally dependent on imported gas.

Actually, the doubts on import dependence are not related to current figures but rather arise from the forecasts showing that natural gas imports will increase in the forthcoming years. Projections on the EU energy demand indicate that natural gas will attain the most significant share in the near future. Natural gas consumption in the EU member states is expected to increase from 533 bcm in 2008 to 753 bcm in 2030, corresponding to an increase of 41% [2]. Moreover, it is also expected that gas production in Germany, Italy and UK will decline substantially over the next two decades. The fall in natural gas production within the EU is expected to further enhance the supply gap over the coming decades, although high gas prices may extend reserves slightly and thus prolong production. So, it is obvious that the EU gas import needs will increase considerably driven by a combination of rapid increase in demand and declining production. As a result there will be an increased import dependency which will affect security of gas supply, not only in the gas sector but also in the electricity sector. Gas demand will partially depend on the level of continued CO_2 emission restrictions and a possible nuclear phase-out in the UK. Projections show that natural gas will meet 30.1% of total primary energy demand in 2030 and EU27 import dependency will be 74% [2].

At present, known natural gas reserves available for gas supply to the EU are in four main locations: the Russian basin, Middle East basin, North Sea basin and Mediterranean basin. Since the EU has already exploited the last two basins in a greater extent, it will focus more on the first two in the near future to meet its increasing demand. Pipelines through Ukraine have enormous significance for the EU gas supply with annual capacity of 120 bcm. All Russian gas supplies through Ukraine were shut down early in January 2006 and January 2009 in a further escalation of the pricing dispute, leaving some EU countries with no gas supplies from Russia in conditions of very cold winter. The reasons for these crises were the combination of fundamental changes in Russia, Europe and in the gas business itself. These crises have caused the EU to question

Table 4
EU27 natural gas imports in 2008 (million cubic meters).

	EU27	Netherlands	UK	Other EU27	Norway	Russia	Algeria	Other non-EU27	Total imports
1.	Austria				1,341	6,707		2,007	10,055
2.	Belgium	7,022	819		5,715	906		2,962	17,424
3.	Bulgaria								0
4.	Cyprus								0
5.	Czech Republic				2,073	7,500			9,573
6.	Denmark								0
7.	Estonia								0
8.	Finland					4,739			4,739
9.	France	8,553			14,134	6,482	7,263	8,784	45,216
10.	Germany	19,972			27,531	40,735		3,753	91,991
11.	Greece			119		2,812	633	641	4,205
12.	Hungary			161		8,814		2,493	11,468
13.	Ireland		4,798						4,798
14.	Italy	9,416		1,165	6,277	22,278	25,992	11,739	76,867
15.	Latvia								0
16.	Lithuania								0
17.	Luxembourg							1,255	1,255
18.	Malta								0
19.	Netherlands			25,337					25,337
20.	Poland			906		7,783		2,513	11,202
21.	Portugal						2,036	2,727	4,763
22.	Romania								0
23.	Slovakia					6,266			6,266
24.	Slovenia			49					49
25.	Spain			310	2,596		13,105	22,584	38,595
26.	Sweden			913					913
27.	United Kingdom	8,440		2,219	25,528		287	535	37,009
	Total	53,403	5,617	31,179	85,195	115,022	49,316	61,993	401,725
			Within EU27			Outside EU27			
			90,199			*311,526*			

Italics in the tables show the share of EU in total figures.

Table 5
EU27 natural gas demand and supply balance by countries in 2008 (million cubic meters).

	Country	Production	Net import (import–export)	Consumption	Import dependency
1.	Belgium	0	17,424	17,424	100%
2.	Estonia	0	889	889	100%
3.	Finland	0	4,739	4,739	100%
4.	Latvia	0	1,325	1,325	100%
5.	Lithuania	0	2,948	2,948	100%
6.	Luxembourg	0	1,255	1,255	100%
7.	Portugal	0	4,763	4,763	100%
8.	Sweden	0	913	913	100%
9.	Spain	17	38,595	38,612	100%
10.	Slovenia	2	1,000	1,002	100%
11.	Greece	14	4,205	4,219	100%
12.	Slovak Republic	102	6,080	6,182	98%
13.	France	934	43,951	44,885	98%
14.	Czech Republic	192	8,605	8,797	98%
15.	Bulgaria	207	3,322	3,529	94%
16.	Ireland	438	4,798	5,236	92%
17.	Italy	9,255	76,657	85,912	89%
18.	Germany	16,361	79,306	95,667	83%
19.	Austria	1,532	7,267	8,799	83%
20.	Hungary	2,643	11,447	14,090	81%
21.	Poland	5,719	11,163	16,882	66%
22.	Romania	10,791	4,189	14,980	28%
23.	United Kingdom	73,385	25,855	99,240	26%
24.	Netherlands	84,693	−36,381	48,312	−75%
25.	Denmark	10,090	−5,516	4,574	−121%
26.	Cyprus	0	0	0	–
27.	Malta	0	0	0	–
	EU27 Total	216,375	318,799	535,174	60%

its dependence on Russia for gas supplies and the EU policy shifted towards a policy to construct a pipeline to bring gas from Caspian and Middle East basin to the EU bypassing Russia. Now, let me focus on this pipeline, namely Nabucco.

3. Nabucco project

3.1. Characteristics of the project

The Nabucco project represents a new gas pipeline connecting the Caspian region and Middle East (via Turkey, Bulgaria, Romania, Hungary) with Austria and further on with the Central and Western European gas markets. The pipeline length is approximately 3300 km (Turkey 2000 km, Bulgaria 400 km, Romania 460 km, Hungary 390 km and Austria 46 km), connecting Georgian/Turkish and Iranian/Turkish border to Baumgarten in Austria (see Fig. 1). The pipeline has been designed to transport a maximum amount of 31 bcm/year. Estimated investment costs including finance costs amount to approximately 7.9 billion Euro.

The pipeline will be constructed in two major stages—first to construct the complete new route from Turkish borders to Baumgarten, and second to construct further compressor stations to increase capacity. The first construction step is split into two separate back-to-back construction phases. The first construction phase, starting in 2011, will cover the planned route between Ankara and Baumgarten, corresponding to the construction of approximately 2000 km of pipeline. After this phase, the existing pipeline facilities between the Turkish/Georgian and Iranian borders could be used for an interim period of 2 years, in order to link the new pipeline to the Turkish borders. This will enable the project to start operation and first gas will flow in 2014 with an initial pipeline capacity up to 8 bcm, while the construction of the rest of the pipeline will be finished in parallel. The second construction phase will run from 2014 until end 2015 and will consist of the construction of the remaining section between the Turkish border to Georgia and Iran. The second construction step will consist of installation of further compression stations at key points of the pipeline in order to continuously increase the pipeline capacity up to 31 bcm/year [5].

OMV (Austria), MOL (Hungary), Transgaz (Romania), BEH (Bulgaria), BOTAS (Turkey) and RWE (Germany) are shareholders in Nabucco Gas Pipeline and each holds an equal share of 16.67% in the project company. The project contemplates that 50% of the pipeline capacity will be reserved for shareholders, with the remaining 50% available to other gas shippers on commercial terms to be agreed. The tender process to allocate capacity is called "open season" and consists of two steps. In the first step, the offer is addressed to the shareholders for an amount up to 15 bcm—50% of Nabucco's maximum transport capacity. In the second step, Nabucco will offer the other 50% to external companies. In this procedure all market participants will have equal opportunity to secure long-term contracts. Open season will start in 2010. The entire process will last around six months.

3.2. Historical background

First talks about the project took place in February 2002 between OMV and Botas, later on MOL, Transgaz, BEH followed. Following a Memorandum of Cooperation in May 2002 between BOTAS and OMV, in a meeting in June 2002 in Istanbul, all five parties to the project signed a protocol on their intention to jointly construct a new gas pipeline crossing Turkey, Bulgaria, Romania, and Hungary and connecting the significant Middle East and Caspian gas reserves with Austria and even further with the Central and Western European gas markets. In October 2002, a Cooperation Agreement was signed between Botas, BEH, MOL, Transgaz and OMV whose main goal was to conduct a feasibility study for the construction of the new gas pipeline. In December 2003, a Grant Agreement was signed between OMV Gas, the other four partners as associated beneficiaries and the European Commission. With this agreement the EU awarded a grant in the amount of 50% of the estimated total costs of the study phase i.e. feasibility study



Fig. 1. The route of Nabucco pipeline project.

including market analysis, technical, economic and financial studies. The Joint Venture Agreement was signed by the Nabucco partners on June 28th, 2005. The Joint Venture Agreement sets out the rules of the Nabucco Partners' participation in Nabucco Gas Pipeline International GmbH (NGPI) and the Nabucco National Companies. In February 2008, RWE (Germany) became 6th Shareholder in the project. The Intergovernmental Agreement (IGA) was signed in Ankara on July 13th, 2009. It is a political agreement between the governments of the Nabucco transit countries, namely Austria, Hungary, Romania, Bulgaria and Turkey. With this treaty an important milestone was achieved as it harmonizes the legal framework and grants stable and equal transport conditions for all partners and customers. Although there is still no guarantee that a final investment decision (FID) will be made and that the pipeline will ever be built, with the intergovernmental agreement signed, the project's chances of being completed have improved to a large extent. With the agreement in place, Nabucco can proceed with signing project-support agreements with each of the five host countries, commissioning detailed engineering work, and launching open season for capacity allocations.

3.3. Strengths of the project

The original impetus for the project was just business. The Turks and Austrians saw it as a way to get new supplies of gas from the Caspian and Middle East, not to mention lucrative transit fees for moving it across their territories into Europe. But politics soon entered into it, as Nabucco won early moral support from Russia skeptics in Central and Eastern Europe. They saw the pipeline as a historic opportunity to build a new lifeline to the West while weakening Russia's grip on them [1]. So, the most important strength of the Nabucco project originates in the fact that gas demand in the EU extensively increases while production declines and the EU therefore aims at having new gas sources without increasing its already high dependence on Russia. The Nabucco project is the principal project capable of delivering an answer to this question. So the fundamental principles that precipitated Nabucco in the first place not only remain but are set to become all the more pertinent in the near future. The EU's gas supply needs to increase by around 40% over the next two decades if it is to keep pace with demand.

As the EU Emissions Trading System (ETS) begins to take effect, coal-fired generation plants will become extremely expensive to run on account of the high levels of CO_2 they emit. By comparison, gas plants produce relatively low quantities of greenhouse gases. As such, the vast majority of EU growth in generation capacity is expected to come from natural gas. The EU countries will not only face the task of increasing their capacity but they also will need to replace existing plants with cleaner ones if they are to remain within the limits imposed by the EU ETS. As the cost of carbon increases, the demand for gas will grow even faster. Concurrently, as the value of gas grows, the Nabucco project becomes economically viable. Thus, as carbon prices are expected to go upwards, the interest in Nabucco becomes greater, which constitutes the second most important strength of the project.

The undisguised hostility of Russia to the Nabucco project and the fears expressed by the EU about a Russian-led "gas cartel" may, perversely, work in favor of the Nabucco pipeline, persuading its sponsors that despite its acknowledged risks, going ahead with the new pipeline would be better than the alternative of being stuck with their current suppliers, mainly from Russia.

Two other developments in 2008 also strengthened Nabucco project. First, substantial gas reserves were discovered in Turkmenistan. This partly addresses the question where the gas would come from (given on-going instability in Iran and Iraq), which had been one of the pipeline's critical weak spots. The second development was political. The governments in Turkmenistan and Azerbaijan have come out in favor of the pipeline and rejected Russian approaches to purchase all of their reserves (even at the European prices).

3.4. Main drawbacks

Nabucco is by no means guaranteed. Long-standing obstacles remain. First of all, it is not clear where the gas needed to fill the pipeline would come from. Russia has signed contracts to acquire most of the gas exported by the Caspian states, while the political situation in Iran and Iraq currently precludes the possibility of transporting gas from or through those countries. For Nabucco to be initially viable, the gas will need to come from Azerbaijan's Shah Deniz 2 field. In fact, without Azerbaijan and its major natural gas supplies, Nabucco is a non-starter. However, Nabucco needs additional suppliers because Azerbaijan can supply only half of the amount needed for its feasibility. Turkmenistan and Iran hold an estimated 7.94 tcm and 2961 tcm proven natural gas reserves, respectively [3] and have the potential to supply gas to planned Nabucco pipeline. Until recently, both of these states were

considered too unstable or hostile to be willing to sell gas to the EU. However, Turkmenistan is showing signs of commitment to supply the pipeline, and although improved Western–Iranian relations are not on the horizon, Iran should be considered a viable supply solution in the long run. So, Nabucco project desperately needs gas from these two countries to remain feasible. Without the involvement of Iran and Turkmenistan, the Nabucco project would be curtailed. At this point, it is also problematic to have access to Iranian or Turkmenistan gas. Iran has to develop its pipeline network in the country's north to make deliveries via Nabucco, which requires major investments.

Second main obstacle to the project comes from Russian antagonism. Russia has been employed and will continue to employ divide and rule tactics through invitations to Nabucco's allies to participate in rival pipeline South Stream project. What's more, in May 2007, Gazprom succeeded in recreating a strong alliance with the gas producers of Central Asia and bounded them to sell major shares of their gas to Gazprom and to install a large pipeline of 80 bcm/year to Russia along the Caspian Sea [6].

The third problem relates to the issues about financing the project. Indeed given the scale of the problems in securing guaranteed supplies of gas for the project, it remains doubtful whether Nabucco will ever be able to secure the necessary financing it requires to go ahead as a purely commercial project, with commercial loans backed by guaranteed income from future gas sales. Without sufficiently long-term binding gas through-put commitments, the project is unable to secure the necessary finance. On January 27, 2009, at the Nabucco Summit held in Budapest, the European Investment Bank (EIB) and the European Bank for Reconstruction and Development (EBRD) committed to provide financial backing for the Nabucco gas pipeline. However, this "commitment" was conditioned on the project meeting "the requirements of solid project financing". Without dedicated gas supplies, and the associated cash-flows, Nabucco may be unable to complete any project financing. Although these tentative commitments from EIB and EBRD, the bulk of the financing will have to come from private sources, at a time when companies are facing severely restricted access to global capital markets.

Soaring construction costs and vast number of parties involved are other problems with Nabucco project. Project costs have soared from 5 billion Euro in 2005 to nearly 8 billion Euro at the end of 2009. The project has also suffered from repeated delays (construction is now expected to begin in 2010, at the earliest) and the vast number of governments and parties involved makes drafting a contract that satisfies all parties a legal and diplomatic nightmare.

The fifth setback relates to investment risks and such risks are not confined to Iraq. The inherent instability of the region between the south Caspian and eastern Turkey offers a potential threat against all Nabucco's potential suppliers. Indeed the past two years have seen several attacks by Kurdish separatists on gas and oil lines both in Turkey and in northern Iran, while both Georgia and Azerbaijan have also to contend with their own serious security problems, which may yet persuade investors that investment in Nabucco is too risky to pursue.

Other problems occur from Turkish demands. Turkey sought to link approval for Nabucco to the opening of the energy chapter in its EU accession talks, which has been blocked by Cyprus. Besides, contrary to agreement that the Vienna based Nabucco consortium would pay taxes only to Austria, Turkey also wanted to guarantee a sort of tax imposed by transit countries on transit gas calculated in terms of the distance that the pipeline passed through the passage country. The most contentious issue, however, had been a long-running demand by Turkey for it to take 15% of the supply for its own needs at discounted prices. The other Nabucco consortium members opposed this. Turkey will instead be allocated a share of the 50% of supply that consortium members can take (the remaining 50% of capacity will be offered to third-party shippers). In return for this concession, Turkey will receive up to 60% of the tax revenues from Nabucco, which is estimated worth up to 450 million Euro a year.

3.5. Its chief rival: South Stream pipeline project

In response to the gas pipeline project that will bypass Russia, Gazprom started a counter work to create a new transport corridor, named South Stream. This project will be a system of gas pipelines linking Russia and Southeastern Europe and Italy via the bottom of Black Sea. Fig. 2 shows the route of South Stream project while Table 6 compares it with Nabucco.

South Stream project is planned to have an annual capacity of 63 bcm and the cost is estimated at around 19–24 billion Euro. South Stream pipeline, covering 3200 km, of which 900 km are routed under the Black Sea, would enable to connect Russia to Bulgaria via the Black Sea by 2015. From that point, it would divide into two branches, one would go to Austria and the other to Italy [7].

On June 23, 2007, Gazprom (Russia) and Eni (Italy) signed a memorandum to construct the South Stream pipeline, transporting gas from Russia's Black Sea to Bulgaria and then to central Europe. The South Stream pipeline, which competes directly with the Nabucco project, is a 50–50 joint venture between Gazprom and



Fig. 2. The routes of Nabucco and South Stream pipeline projects.

Table 6
Nabucco vs. South Stream.

Characteristic	Nabucco	South Stream
Pipeline design capacity	31 bcm/year	63 bcm/year
Estimated cost of the project	8 billion Euro	19–24 billion Euro
Pipeline length	3,300 km	3,200 km (900 km under the Black Sea)
Start of active negotiations	2002	2006
Political support from the EU and US	Yes	No
Project company	Yes	Yes
Ship or pay contracts signed	No	No
Requirement for additional partner	High	Low
Opportunity to attract project financing	Low	High
Investment decision made	No	No
Possible start time of the construction	2010	2011
Possible construction completion time	2019	2015

Eni, Gazprom's single largest customer. Moreover, Russia signed intergovernmental agreements for the project with Serbia (January 25, 2006), Bulgaria (January 18, 2008), Hungary (February 28, 2008), Greece (April 29, 2008) and Slovenia (November 14, 2009). At present, negotiations are underway to sign a similar agreement with Austria. So far, Russia has not received the consent of Romania and Ukraine to the offshore pipeline sections passing through their economic zones. This may have a negative impact on the project.

To undermine Nabucco, Gazprom also signed gas purchase agreements with Central Asian countries in late 2007, conceding substantial price increases (up to $150/1000 cubic meter) in exchange for control of most of the gas volumes they export [8].

4. Policies on Nabucco project

4.1. Policy of the European Union

The EU has agreed on its energy plan based on sustainability, competitiveness and security of supply. This plan, as indicated by the Second Strategic Energy Review, necessitates reduction of greenhouse gas emissions by 20%, increasing the share of renewables in the energy consumption to 20% and improving energy efficiency by 20%, all of it by 2020 [9]. This agenda attributes a special significance to natural gas which is expected to grow in consumption and contribute to the targets set for reducing greenhouse gas emissions.

Within this context, the EU has finally signaled its willingness to fund Nabucco project. At a summit in Brussels, the EU leaders gave final approval to a 200 million Euro grant towards the construction costs but made it clear that it does not intend to increase its contribution. The EU may offer loans and guarantees, but it has no intention to provide capital financing as this turns the project into a public–private partnership. The EU's position with regards to Nabucco is weakened by differing levels of support for the project among its members, and more broadly, the absence of a coherent energy policy. For instance, in the wake of the Russia–Ukraine gas crisis at the beginning of 2009, Eastern European governments reiterated their support for Nabucco pipeline at a meeting in Budapest in January 2009. In response to Eastern Europe's pledged support, Germany and Italy moved against the project on the grounds that the construction of Nabucco is unlikely to begin for many years. However, in reality, truth is that neither Germany nor Italy is keen to invest in energy diversification projects, having secured bilateral energy treaties with Russia. Similarly, France, with its nicely diversified supply of energy, has little appetite for changing the status quo and is far less willing to antagonize Moscow by bringing non-Russian gas into Europe through former Soviet satellites. Indeed, these positions reflect the most substantial threat to Nabucco; namely, the lack of political will in the European capitals. Germany, Italy and even member states of the Nabucco consortium have all entered into bilateral agreements with Russia, seemingly undermining the project. Together, these countries have blocked any effort within the EU to allocate funding for Nabucco or even make support for the pipeline a common policy.

4.2. Russian policy

With its rich proven reserves ranking 1st in the world, geographic location, rapidly developing pipeline systems, technical skills and know-how, Russia is the most important energy partner of the EU and ready to do what is necessary to keep its current position. Russia's monopolistic strategy with a mix of geopolitical and commercial interests has been most visible in its efforts to undermine a common EU energy policy. Russia tries in particular to undermine the Nabucco-gas pipeline with a rival pipeline (South Stream) notwithstanding the fact that it will cost at least twice as much as Nabucco does. It has also sought to strengthen its gas pipeline monopoly not only from Central Asia (Turkmenistan, Kazakhstan, Azerbaijan) but also from all other real and potential gas suppliers to the EU member states (such as Iran, Qatar and North-African states) by offering to buy all their gas for exports to the EU. Gazprom's activities in Middle East and North Africa as well as Russia's willingness to increase Gazprom's market share in the EU market implies that Russia is in search of a "gas containment policy". Current aggressive Russian policy towards Nabucco seems to be just a part of this containment policy.

In brief, Russia uses all available means to prevent the Nabucco project. It manipulates politicians and resorts to old-fashioned bullying, especially in the states that Nabucco transits. It also acquires stakes in the European energy companies that could complicate Nabucco's completion and tries to buy up natural gas in Central Asia and the Caspian, even paying up to four times more than in previous years, to deny supplies to Nabucco. Along with all these it proposes a rival pipeline that costs twice more than Nabucco.

If there is still any doubt about how far Russia would go to fight for its interests in global gas market, one should look at Georgia, which is still in the recovery process after Russia's invasion last summer. Georgia is the key transit state hosting two pipelines that bring oil and gas from the Caspian to Turkey. By attacking its small neighbor, Russia effectively warned not only Georgia but the whole neighborhood.

4.3. Turkish policy

Turkish policy on Nabucco has been quite inconsistent from the beginning. On the one hand, Turkey genuinely supports Nabucco project as it not only strengthens its geopolitical importance and provides huge transit revenues but also improves its position as an energy corridor that bridges Caspian region and Middle East to Europe. On the other hand, Turkey has until now been seen as an obstacle because as a principle it insists on the right to consume 15% of the gas from any pipeline built on its territory, to be purchased at a "reasonable price". There has also been a suggestion that the Turkey wanted to tax gas in transit and play the role of a middleman in the Caspian/EU gas trade, rather than being a transit state. Further complicating the situation, Turkey sought to link approval for Nabucco to the opening of the energy chapter in its EU accession talks, which has been blocked by Cyprus.

Before Nabucco project, Turkey had a weak position. It had been declined many times for the EU membership and depended on Russia for a majority of its natural gas. But now, with the country's gas demand skyrocketing and Turkish supply contracts with Russia

set to expire, Turkey, on whose land about 60% of the pipeline will lie, seems to try to take advantage of Nabucco project and use its geographic position to meet its gas demand at low prices and get a short-cut to the EU membership.

Turkey is also prone to use its Nabucco card in other political issues. For instance, when the EU asked the Nabucco consortium to bring in a European gas major as a sixth partner to increase not only political and business support for the project but also its feasibility, Botas (Turkey) declared it was breaking off talks with Gaz de France to fill that role because of Turkey's political problems with France.

Nabucco project also faces another challenge from Turkey as it looks to buy up all the available gas from Azerbaijan, the only country that looks most likely to supply the line in the first years of the project. Today, there is little wonder that Turkey's first priority is to ensure that its gas needs are met, ahead of his commitments to Nabucco.

4.4. Azeri, Turkmen and Iranian policies

Before it gets cash, Nabucco needs to secure adequate supplies of gas. Azerbaijan, Turkmenistan and Iran are three potential gas suppliers for Nabucco project with large proven reserves.

Azerbaijan is being regarded as the main source for the initial stages of the project with supplies to come from the second development phase of the country's offshore Shah Deniz gas field. Azerbaijan has affirmed its desire to supply gas but has acknowledged that its resources are insufficient to fill the pipeline in the longer term. Actually, Azerbaijan's support for Nabucco arises mainly from a desire to reinforce its ties with the West. The short war between Russia and Georgia in August 2008 has drastically improved Azerbaijan's perception of the value of Western support in the event of a crisis. Also, Russia's decision in August 2008 to close for several hours for maintenance Azerbaijan's only oil export pipeline that crosses Russian territory was seen in Azerbaijan as a direct Russian threat. Besides, Russia's approach to Ukraine in January 2009 caused alarm as it was perceived to demonstrate that Russia was prepared to hurt its own commercial interests in order to punish a neighbor.

Recently, Nabucco's supporters in the EU have started to get their acts together and Azerbaijan has begun to take notice of that, too. In May 2009, the EU signed a deal with Azerbaijan, which committed to building energy and trade links directly with the EU. This was arguably a more valuable agreement than the one Azerbaijan later signed with Gazprom, which offered not money but only vague pledges that may or may not be met. Moscow has offered and will keep offering to buy all Azeri gas output at world prices. Although this is an extremely attractive offer for Azerbaijan, which has long sold gas to Turkey and Georgia at prices far below the world rate; Azerbaijan continues to turn Russia down because it aims to move away from Russia in order to diversify its export outlets. However, if Azerbaijan accepts Russian offer one day, it effectively turns Nabucco into a pipedream.

At present, Turkmenistan does not really have much choice as it is a landlocked country and can only evacuate its gas via Russia. By promising increasingly remunerative prices and by signing long-term supply contracts, Russia tries to undermine gas pipeline projects (like Nabucco), which could be used for evacuating Turkmen gas via other routes. However, Turkmenistan wants to supply Nabucco pipeline for three reasons. First of all, Nabucco provides an alternative to reduce its dependence on Russian pipelines. Second, Nabucco is the shortest route from Turkmenistan to the EU. Third, the EU will continue to pay the highest prices, making it the most attractive gas market for Turkmenistan.

Of the potential suppliers, Iran seems to be the best position as it has been exporting gas to Turkey since 2001. But recent events have cast doubt on Iran's status as prime supplier for Nabucco. Iran's frequent suspensions of gas supplies to Turkey citing "technical problems" due to cold weather have raised questions about the country's willingness to offer security of supply. This has not been lost on the Nabucco partners, who have emphasized that the project could go ahead without Iranian gas. Moreover, its alleged nuclear weapons program is another obstacle to Iran's status as a gas supplier to Nabucco. It is almost impossible to include Iran into project until the dispute is resolved. Even if that happens soon, there are grounds to doubt whether Iran could deliver within a timeframe acceptable to the EU. Iranian gas production has remained constant for years; currently, most of the country's output is used for reinjection in the country's oil fields. Given the required level of investment in Iran, as well as a change in its international relations, the prospects of sizeable Iranian volumes entering Nabucco by 2020 are extremely weak.

4.5. Hungarian policy

Hungary has interests in both Nabucco and South Stream projects. From Hungary's point of view, South Stream arguably has more to offer. Nabucco has so far been seen as a straight gas transit proposition for MOL, the national oil and gas company. But in conjunction with South Stream, MOL expects to build some 10 bcm of underground gas storage, which would be a major source of revenue and turn Hungary into a Gazprom "hub" for supplies to western Europe. Hungary will not only receive tax revenue from these sites but also get considerable energy security from the fact that its storage facilities add up to nearly 100% of the country's total annual gas consumption. For these reasons, it has recently been concerned that Hungary may turn to South Stream and withdraw its support from Nabucco project, which jeopardizes the future of the Nabucco. These concerns are worrying to both the project's sponsors and the EU, especially given Hungary's already strong relationship with Russia.

5. Analysis of the policies

In many respects, the EU gas market is a captive one that is largely dependent on pipeline supply from Russia (whether Russian gas or gas from upstream countries that use Russian transit pipelines) especially to meet peak winter demand. Given the projected increase in the EU demand for natural gas, its declining gas reserves, and the planned construction of the North European Gas Pipeline, which will directly connect Russia's pipeline system with the European gas grid, the EU will be even more dependent on Russian gas supplies in coming years.

When a captive market is dependent on supply from another region within the same country, the captive market often relies on regulation from the central government to protect it. There is no central government to protect the EU from Russian market power. Under these conditions, the best protection against market power is the development of competitive alternatives. Even no regulatory regime can check the market power of a gas supplier as effectively as competitive pressure [10]. Therefore, the best policy for the EU seems to be supporting Nabucco project to break monopoly power of Russia in the EU gas market.

The risk associated with relying on Russian gas and Ukrainian transit routes is not the only threat to the European gas supply security. A chronic lack of investment in Russia's gas constitutes another source of risk. Russia relies on Europe for security of demand, but mismanagement of the industry means that Russia may not be in a position to meet the EU demand by 2020. This fact contributes to reasons why Nabucco is indispensable for the EU. Nabucco may not only effectively break Russia's stronghold on gas exports to Europe by importing gas from the Caspian and Middle

East without crossing Russian soil but also provide an additional route of gas supply to meet the EU demand. Potentially, Nabucco can supply 5–10% of the EU gas demand and will provide immediate tangible security-of-supply benefits if operationalized.

Under these circumstances, the EU leaders are expected to accept that Nabucco project is fundamentally a political one requiring the EU funding and to agree to provide a share of the finance. Unless the EU leaders are prepared to support the project financially, there is little prospect of the potential suppliers publicly committing themselves to Nabucco. And without guaranteed suppliers, financial backing will not be forthcoming. Direct financial support to Nabucco from the EU is a move that requires a major shift in the current EU energy policy but it is also one to which the EU increasing appears to have no alternative.

Traditionally, energy policy has been seen as a domestic matter in the EU, not a European issue. However, the present situation, where each member country tends to have its own energy policy separately, is simply unsustainable. The EU members have to recognize that energy in general and natural gas supply security in particular are now the EU issues and realize that each member country can no longer, by itself, deal with the energy challenges that face the EU. Member states have to work together, if they are to implement ambitious targets concerned with improving energy security. Actually, there is nothing new about fact that Europe's difficulty in securing energy supplies derives from self-inflicted division. However, this has to change as the present situation is no longer sustainable. For Europe not to have a common energy policy means the EU does not have control of its energy destiny. Furthermore, the suggestion that a common energy policy emerging from *coordinated* member states would reduce dependency is erroneous and marks a deeper misunderstanding perpetuated in the EU documents. To realize its targets, a *coordinated* policy is not sufficient for the EU, which needs a *united* one. Today, even if armed with supranational powers, the EU could not negotiate gas supply contracts with suppliers on behalf of its member states and cannot itself conclude contracts as a single, importing entity. In the absence of this specific competence, the aim of coordinating currently uncoordinated gas supply policies of its member states with the goal of "speaking with one voice" is excessively ambitious at best and unachievable at worst. All the EU member states should recognize the fact that the most important aim of any monopoly is to extract monopoly rent from its customers and Russia is not an exception. Its current policy of "divide-and-rule" may require it to behave nicely towards some EU countries (especially Germany and Italy) but sooner or later the EU as a whole will have to pay price of depending heavily on Russian supplies and pipelines.

Without an alternative gas delivery infrastructure capacity, the EU will be at the mercy of a Russian decision to halt supplies. One need not look any further than Russia's decision to temporarily cut supplies first in January 2006 and then in January 2009 to the Ukraine, a country that transports roughly 80% of the Russian gas destined for the EU markets, to see this. To reduce reliance on pipeline supply from Russia and the countries that will deliver gas through the Russian pipeline network, the EU must develop new gas delivery infrastructure that can access other gas supplies. With new delivery infrastructure in place, the EU need not curtail deliveries of gas from Russia. The EU needs only to diversify its supply sources and have in place a degree of redundant capacity to mitigate the risk of curtailment from any one source, enhancing energy security.

The idea that Russia is going to stand by and watch very large pipelines being built to carry gas from Caspian and Middle East regions to Europe and have no influence and no say in their building is probably naive. Unlike the EU, Russia acts according to what it regards as its best interest. Gazprom is doing everything possible to "shoot down" the Nabucco project. Russia has taken the initiative to sign long-term supply agreements in Caspian countries with significant gas reserves and therefore today no one is sure which gas will be conveyed via the "Nabucco" network. Also, Russia has many times proved that it is ready to use physical force to protect its interests in gas market.

In this opera, Turkey has been cast in one of the leading roles. With its indispensable geographic position between the oil and gas reserves of Iraq, Iran, and the Caspian, it is an absolute certainty that Turkey will host major pipelines sooner or later. If Nabucco succeeds, Turkey will be one of the biggest winners both economically and geopolitically. However, Turkey's opportunistic policy so far seems to undermine the project. Ankara's willingness to "play the energy card" in all occasions poses two deep questions for the EU. First, will Turkey follow Ukraine's example and become more bullish in exacting transit fees? If so, this could prove an even bigger obstacle to Nabucco's eventual realization than securing upstream reserves. Secondly, and perhaps more importantly, does shifting dependence from Russia and Ukraine to Caspian region and Turkey necessarily improve security of supply? Today, Nabucco's gas needs appear increasingly to be in conflict with those of Turkey, which also aims at finding new sources of gas both to meet increasing demand and to reduce dependence on Russia. However, if Nabucco fails, Turkey will be even more dependent on Russia and will lose billions of dollars of transit revenues, let alone employment opportunities created by constructing 2000 km pipeline on its soils. So, Turkey needs to focus more on its long-term interests (rather than short-term opportunistic maneuvers) while determining its policy on Nabucco.

It is obvious that, initially, Nabucco will rely on Azerbaijan's massive Shah Deniz 2 gas field. This is a realistic source for the EU gas deliveries, but the EU wants the gas by 2012. While Nabucco's planned capacity is 31 bcm/year, start-up volumes could be as little as 10 bcm/year. Nabucco expects that Shah Deniz 2 field will supply 8 bcm annually when it comes on stream in 2013. However, this volume is not sufficient to make project feasible from an economic point of view. Iran may also be seen as a potential supplier, but this is impossible until the dispute surrounding its alleged nuclear weapons program is resolved. And even then, there is no certainty that Iran could deliver within a timeframe acceptable to the EU. Turkmenistan, Kazakhstan, Iraq and even Russia have been listed as other possible supply sources for the Nabucco pipeline, but there are risks associated with all of these potential supply sources. So far, no guarantees have been given to fill the pipeline with real gas volumes.

6. Conclusion

Faced with a serious challenge in the form of Russian backed South Stream pipeline, the Nabucco project continues to have difficulty finding enough gas to make the line viable. However, no-one has ever claimed that Nabucco would be an easy project to realize. Putting together a purely commercial project bringing gas 3300 km across Turkey to central Europe was a tough call. So far, no single pipeline project that sources gas from a portfolio of suppliers, requires multiple transit agreements and supplies an equally diverse portfolio of customers has been realized.

For the EU, the Nabucco line offers a valuable alternative source of supply to Russia, whose increasing control over gas exports into Europe has become a significant concern for the EU. In the end, the Nabucco pipeline will probably be built not only because the EU and the US are putting their political weight behind the project but also because the gap between the EU gas demand and supply is set to rise sharply in the coming decade. In reality, South Stream and Nabucco are neither competitors nor mutually exclusive pipeline projects. Projections show that Europe will need more additional gas than the combined capacities of both projects. The EU gas

market is large enough to accommodate many such projects and the associated gas volumes. Even if built and fully charged together, two projects only supply 15–20% of the EU consumption. Actually, demand for gas from Nabucco far outstrips its capacity. If realized, it is obvious that Nabucco will be two to three times overbooked. However, all these do not mean that Russia will stop undermining Nabucco. It will continue to do so as its main concern is not the EU gas security but preserving its position as a monopoly in the EU and a monopson in Central Asia.

Within this context, the fate of Nabucco depends largely on whether or not the EU members and other actors (Turkey, Azerbaijan, Turkmenistan, Iran and so on) are ready to act based on their long-term interests. The history has shown that power corrupts and absolute power tends to corrupt absolutely. Unless curtailed, sooner or later, all actors will suffer from Russian monopoly power either in the form of excessively high gas prices or in the form of supply interruptions.

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